



Dear Readers of the Journal “Invertebrate Zoology,”

We present you special issue of the journal dedicated to the memory of the outstanding zoologist Professor Claus Nielsen, who passed away on January 18, 2024. We have lost a figure whose name epitomized the golden age of evolutionary morphology of animals. This is why the editorial board of *Invertebrate Zoology* unanimously decided to dedicate this special issue to Professor C. Nielsen. We had no doubt

Claus Nielsen at International congress on invertebrate morphology (ICIM-3), in Berlin, August 2014. Photo by Andrey Ostrovsky.

that zoologists would respond to our invitation to submit articles for this issue, and we are pleased to confirm that our expectations were met. Within these pages, you will find contributions from esteemed scientists and emerging researchers from various countries. The articles cover a wide range of topics, but all are inspired in one way or another by the ideas of Claus Nielsen. We are deeply grateful to everyone who responded to our invitation and submitted manuscripts for this special issue.

The French mathematician Jacques Hadamard once said, “Genius mathematicians propose theorems; talented ones prove them.” Claus Nielsen was not only a talented researcher; he was



I took this photo at our yearly Marine Invertebrate Section summer picnic back in 2002. Claus walks with an annelid colleague from the section, Mary E. Petersen. Photo and description by Martin Vinther Sørensen.

a genius who generated new ideas in zoology. The hypotheses he proposed continue to inspire researchers and will do so for many years to come. As A. Weismann stated, “Ohne Hypothese und Theorie gibt es keine Naturforschung” (There is no study of nature without hypothesis and theory), and this is absolutely true. In the field of evolutionary morphology, any scientist will inevitably find themselves in a position where they must compare their findings with the ideas proposed by Claus Nielsen. This is not surprising; Claus Nielsen was a genius, while we are, at best, talented.

Claus Nielsen initiated the International Congresses on Invertebrate Morphology (ICIM) and was an active participant in them. Russian zoologists fondly remember his attendance at ICIM 4, which took place in Moscow in 2017.

While these congresses will now be held without Claus Nielsen’s presence, it cannot be said that they will be without his influence, as it is impossible to imagine modern evolutionary morphology without him.

In this issue, you will find statements from zoologists from various countries reflecting on Claus Nielsen not only as a scientist but also as a person. He was a wise and noble man whose support opened the door to science for many young researchers. Russian zoologists remember Claus Nielsen with particular warmth; he valued and supported their research, and his opinion was of great importance to us.

We will never forget Claus Nielsen.

*Prof. Dr. Vladimir Malakhov,
Editor-in-chief*



Photo by Laura Pavesi is from Claus' 80 years birthday, 2018.

Colleagues and friends about Claus Nielsen

Prof. Dr. Natalia Biserova:

I remember his gentle smile beneath a grey moustache..., his attentive eyes..., his quiet voice, and the soft yet persuasive arguments he offered in response to my emotional objections. I recall our walks around Berlin... And most importantly, his sharp, unwavering conviction in the necessity of active participation in invertebrate morphology research — even amidst the explosive rise of molecular genetics. He was the ideological inspiration, initiator, and founding force behind the International Society for Invertebrate Morphologists (ISIM). He authored its

constitution, served as its first president. Thanks to his energy, hundreds of scientists from different countries were united to discuss achievements at International Congresses on Invertebrate Morphology (ICIM). The ideas born from these collaborations shaped the trajectory of zoological science for decades to come.

Dr. Anastasia Borisanova:

I recognized Klaus Nielsen's name when I started studying Kamptozoa as an undergraduate — I had seen his name as the author of many excellent papers on this taxon. He was undoubt-

edly the world's leading expert on entoprocts. Of course, this group was not his only or main interest, but he made enormous contributions to the study of these animals, so in my memory he remains above all a Kamptozoologist.

Prof. Dr. Andreas Hejnol:

I met Claus for the first time in an international course about EvoDevo in Roscoff, where I participated as a student. That was back in 1997 and I recognized him as a very famous person and author of the textbook *Animal Evolution*. He was a very knowledgeable naturalist, interested in all aspects of zoology, phylogeny and the evolution of animals. Since then, we met often on conferences and Claus was also an essential part of our international courses in Kristineberg, Sweden. Claus filled the first two days with the animal diversity of the fjord and with his famous 2x 90 minutes ALL ANIMALS lecture. I will remember Claus as a very kind, humorous person, who was simply lovable.

Dr. Gregory Kolbasov:

The Dangers of Smoking (An Incident in the Canteen): memories about Claus Nielsen

It is no secret that the Danish scientific community is highly regarded worldwide, despite the small size of Denmark itself. This is particularly true for zoological science. As a zoologist, I was fortunate to work several times at the Zoological Institute of the University of Copenhagen during the late 1990s and early 2000s, alongside Professor Jens T. Høeg. The Zoological Institute is closely linked to the Zoological Museum, and the two institutions function as a single scientific entity. People go to the museum for SEM, and to the Institute for TEM, among other things. I first found myself there in 1996, and Jens immediately introduced me to Claus Nielsen and Reinhardt Kristensen, who were then at the height of their scientific fame and were the scientific leaders of the museum.

We would often go to the museum's canteen for lunch. It was a small, cozy place where you could buy beer and smoke, as there were ashtrays on the tables. Claus had a special group of about five or six senior scientists, aged 50–60+, who would gather after lunch. They would bring various teapots and coffee pots with them, sit at a separate round table, and engage in long conversations, likely about science. Interestingly,

none of them smoked. One day, we went to lunch with Jens's PhD student, Henrik Glenner, who is now a professor in Bergen. After lunch, we lit up cigarettes. Claus got up from his round table, walked over to us, and said: "Do you know you can't smoke here?" I could not think of anything better to answer, "What, then what are the ashtrays for? I used to smoke here." "Well, you can't," Claus replied. I felt a little awkward, but Henrik saved the situation by saying, "Greg didn't know about it. It's my fault. Sorry." We promptly put out our cigarettes. We sat quietly, drinking tea or coffee — though I can not quite recall which one. About 10 minutes later, Reinhardt came to our table. He pulled out a cigarette, lit it, and — "Holy shit!" I thought. "So, the locals and the senior scientists can smoke, but we can't? What's going on here?" It felt a bit unfair. To make matters even more confusing, Claus's group was still at their table, calmly drinking tea, and no one seemed to be rushing to judge Reinhardt. I turned to Reinhardt and said, "Do you know you can't smoke here? Claus just said so." He replied, "What do you mean you can't? It's already 2 o'clock in the afternoon. Yes, you can." It turned out that Claus had made his remark about 10 minutes too early, before we were actually allowed to smoke. I still can't tell if he was joking or being serious. Claus was a very reserved person who often only smiled slightly, making it hard to interpret his reactions. In any case, he wasn't offended by me. In fact, my next visit in 1998 was funded by a grant from him. But by that time, the canteen had already closed, and I had decided to quit smoking.

Dr. Tatyana Kuzmina:

Claus Nielsen significantly advanced the study of brachiopods. His groundbreaking paper on the development of *Novocrania anomala* laid foundation for understanding of body plan formation and evolution of brachiopods.

Prof. Dr. Vladimir Malakhov:

They said that Carl Gauss was the last person who knew all mathematics. It would not be an exaggeration to say that Claus Nielsen was the last person who knew all the zoology of invertebrates. There will be no one else equal to him. And yet, Claus Nielsen was a warm and sympathetic person. Even now, when I think about him, I feel like I'm not lonely.



1986: T. Wolff, J. Just, C. Nielsen, K.W. Petersen
G. Høpner Petersen, E. Rasmussen, F.J. Madsen, J.B. Kirkegaard, J. Knudsen

This photo is a little atypical, but also fun I think, and perhaps the oldest photo you'll get with Claus. It's a section group photo of the Marine Invertebrate Section, Zoological Museum, University of Copenhagen, as it appeared in 1986. Besides showing a relatively young Claus, it also provides evidence for the fact that he always would wear a butterfly back then. Photo and description by Martin Vinther Sørensen.

Prof. Dr. Andrey Ostrovsky:

Frankly, death of Claus was shocking to me and my family. We were close friends for many years. Claus was a great expert in paintings and classical music, he enjoyed his life often traveling to his favorite southern France. As to the science, we discussed things related to the bryozoan reproduction that he studied in his early days in the USA. He was happy that I follow the main lines of his studies. And he was very helpful — searching for old specimens, rare literature, etc. Initially, Claus was very sceptical about molecular revolution in zoology. We often discussed the dramatic changes in phylogenies,

and step by step, his view changed too. I guess, he never accepted the new way of thinking entirely, but tried to adopt at least most important issues in his 3rd Edition of his “Animal Evolution” — a book for generations of biologists. Claus always smiled, and everyone knew this habit. Anytime when I visited his working room, he met me with his smile. Always friendly, always busy...

Prof. Dr. Andreas Schmidt-Rhaesa:

I admire Claus Nielsen for his ability to summarize relevant information and ask the right questions — as remarkably done in each of the three editions of his book *Animal Evolution*. He



Claus Nielsen at Phylogenetic Symposium in Hamburg, 2008, with Andreas Schmidt-Rhaesa. Photo by A. Schmidt-Rhaesa.

was always open, interested and modest — ideal characteristics to serve as an outstanding example for the zoological community. Claus, we miss you, but your footsteps remain.

Prof. Dr. Martin Vinther Sørensen:

“Claus Nielsen loved to discuss animal evolution. For him it made no difference if he talked with a student, a postdoc or a full professor. All he cared about was their shared passion for animal evolution”.

Yesterday (27/08/2024) I tried to think about a quote for Claus, and it is of course impossible, to contain a personality like him in one or two sentences. However, one thing that I’ve always appreciated about Claus is how he loved to come and talk about zoology and evolution. Even back in the mid-90’ies, when I was only a grad student, his door was always open. I could come and ask him questions, discuss with him, and share my ideas. A little later, while I was a postdoc, he was working on the 2nd and 3rd editions of his *Animal Evolution* book, and he would often come to me, to discuss thoughts and ideas for the books. I always felt a bit flattered

that someone with his knowledge, could use my input for anything.

I’m really glad that you are taking this initiative, and I’m excited to see the final result. Claus meant a lot to me, and it’s been like this throughout my career. My very first step into evolutionary zoology was actually through a written assignment where I was criticizing one of Claus’ papers. I had not met Claus by that time, but after I handed in the project assignment, I received message that Claus would like to see me. I almost crapped myself, and suddenly I felt extremely small and ridiculous because I — with my 3 months experience as zoologists — had been criticizing someone with more than 40 years’ experience. But Claus was of course very accommodating, and starting out thanking me for reading his paper so carefully. That became the beginning of a collegial friendship that lasted nearly 30 years.

I might also have been the last colleague that saw Claus, as I went to visit him the day before he passed. It was emotional to leave him that afternoon, because I could tell that it was close now, and that this would probably be the last

time I saw him. Claus was a great personality and scientist, and I'm happy to know that so many people will remember him.

Prof. Dr. Elena Temereva:

My acquaintance with Claus Nielsen began with his papers devoted to the work of ciliary bands in bilaterian larvae, because I and Prof. Vladimir Malakhov, we have discussed this issue in our articles about the phoronid development. I met Claus personally in 2011 in Harvard (USA), at the ICIM-2, where he reported his ideas about the Bilateria phylogeny. At the ICIM-3 in Berlin, after my plenary report, Claus asked me about

general problem of the organization and evolution of tentacles in Bilateria and we discussed it for a while. And then this topic captured me for a long time and led to the appearance of many papers on the structure and evolution of the lophophore in lophophorates and the tentacle apparatuses in Bilateria as a whole. Thank you, Claus, for your interest to my studies and for your great evolutionary ideas, which gave rise to many new scientific issues. Let your both great brainchilds — International Congress on Invertebrate Morphology (ICIM) and International Society of Invertebrate Morphologists — have active and long, long life.